

AMENDMENT TO THE CLAIMS

1. (currently amended) A temperature regulated, enclosed intrinsically safe electrical energy storage cell pack for an intrinsically safe hand held portable instrument in an industrial process control system, comprising:

a plurality of electrical energy storage cells wherein the electrical energy storage cells are elongate and aligned parallel to one another and side by side;

a plurality of electrical interconnects arranged to electrically connect adjacent electrical energy storage cells;

electrical leads ~~configured to~~which couple the plurality of electrical energy storage cells to the intrinsically safe ~~to the~~ hand held instrument;

a plurality of elongated separation bars positioned between the adjacent electrical energy storage cells and between the plurality of electrical interconnects to thereby reduce shorting and provide mechanical support;

first and second half shells position in physical contact with an on opposing sides of the plurality of electrical storage cells, the half shells having a gap therebetween to allow thermal expansion of the half shells during heating, each half shell comprising:

a first layer of thermally conductive material that is shaped to conform to a cylindrical portion of an outer surface of the electrical energy storage cells, the first layer terminating at first layer ends that are on the cylindrical portion of the outer surface of the electrical energy storage cells, and the first layer having a first thickness and a first value of thermal conductivity;

a second layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the first layer, contacts all of the outer surface of the first layer, and that extends beyond the outer surface to enclose the first layer ends, the second layer defining an exterior surface of the enclosure of the electrical energy storage cell which separates the electrical energy storage cell pack from the explosive environment, the second layer having

a second thickness and a second value of thermal conductivity; and the first and second thicknesses and the first and second values of thermal conductivity conforming the enclosed electrical energy storage cells to a combustible atmosphere temperature classification that specifies an outer surface temperature during an electrical short circuit of an electrical energy storage cell, the enclosure controlling the outer surface temperature of the combined enclosure and electrical energy storage cells such that the temperature regulated, enclosed electrical energy storage cell pack comprises intrinsically safe equipment in the explosive environment;

a protective device including a fusible link coupled to a connected lead and the electrical storage cells which is encased in potting compound; and

wherein an exterior temperature of the second layer is less than 130°C during the electrical short circuit of the electrical energy storage cell.

2. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the electrical energy storage cell produces heat at a hot spot during the short circuit and the first layer of material spreads flow of the heat over a portion of the outer surface of the first layer that is larger than the hot spot and the second layer of material retards flow of the heat to an outer surface of the second layer.

3. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the temperature of the outer surface of the second layer has a measured maximum temperature of 130 degrees centigrade or less during the short circuit condition.

4. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the first layer of material comprises aluminum.

5. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack

of Claim 1 wherein the first layer of material comprises copper.

6. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the second layer of material comprises heat-shrink tubing.

7. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the second layer of material comprises elastic material.

8. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the first layer comprises two thermally conductive half-shells that each enclose one side of a round surface of the energy storage cell.

Claims 9-35 (canceled)